



UNIVERSIDADE DO VALE DO TAQUARI - UNIVATES
CURSO DE CIÊNCIAS BIOLÓGICAS - BACHARELADO

**A NEW SPECIES OF *Tetranychus* (PROSTIGMATA:TETRANYCHIDAE) FROM
PAMPA BIOME, RIO GRANDE DO SUL STATE, BRAZIL**

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Artigo apresentado na disciplina de Trabalho de Conclusão de Curso, do curso de Ciências Biológicas, da Universidade do Vale do Taquari – Univates, como parte da exigência para obtenção do título de bacharel em Ciências Biológicas.

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Lajeado, novembro de 2018

Este trabalho está escrito em formato de artigo conforme a revista científica *Systematic and Applied Acarology*.

A new species of *Tetranychus* (Prostigmata:Tetranychidae) from Pampa biome, Rio Grande do Sul state, Brazil.

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Abstract

A new species of the spider mite *Tetranychus agriensis* **sp. nov.** (Acari: Tetranychidae) collected on *Sida rhombifolia* L. (Malvaceae) from Pampa Biome is described. The species has a unique dorsal stria pattern and a forked aedeagus.

Key words: Acari, Spider mites, *Sida rhombifolia*, Malvaceae, Phytophagous mites.

Introduction

Rio Grande do Sul State is divided into two biomes: one at south, covered by Pampa and another at north, covered by the boundary of Atlantic Forest biome (Fiaschi & Pirani 2009). The Pampa biome vegetation is characterized mainly by grasses in fields and some riparian forest (Carvalho et al. 2009; Behling et al. 2005; Roesch et al. 2009). This biome stands out for presenting high levels of fauna and flora biodiversity and for having a unique richness, also presenting high rates of diversity and endemism (Behling et al. 2009, Bencke 2009, Bilenca & Miñarro 2004). This is the first description of Tetranychidae from Pampa Biome to Brazil.

There are 112 species of Tetranychidae in Brazil, being *Tetranychus* the second more abundant genus, with 24 species (Migeon, Nougier & Dorkeld 2011). The *Tetranychus* has some specific characteristics, like opisthonotum with 11 pairs of setae (c1-3, d1-2, e1-2, f1-2, h2-3; setae h3 ventral); setae f1 in dorsocentral position, dorsal opisthosoma with striae, two pairs of genital setae (g1-2), two pairs of pseudo anal setae (ps1-2); tarsus I with two pairs well

separated duplex setae, tarsus II with one pair of duplex setae and empodium split distally with four tenent hairs (Baker & Tuttle 1994).

Until now, there was three records from *Tetranychus* on *Sida rhombifolia* to Brazil, *Tetranychus armipenis* Flechtmann & Baker, *Tetranychus ludeni* Zacher and *Tetranychus urticae* Koch (Flechtmann & Moraes 2017; Reichert et al. 2014). This is the fourth record of *Tetranychus* in this plant species from the country. In this paper, a new species of the plant-feeding *Tetranychus* is described and illustrated based on the specimens collected, in the state of Rio Grande do Sul, Brazil.

Material and methods

Leaves of *S. rhombifolia* were collected in riparian forest, Pantano Grande County, Rio Grande do Sul state, Brazil (30°19'42.88"S, 52°29'53.28"W), 108 meters above sea level, on February 20, 2017. We placed the leaves collected separately according to the species of plant in plastic bags, and kept them in Styrofoam box with Gelox® at low temperature until they arrived at the laboratory where they were maintained in a refrigerator at approximately 10°C for a period of up to five days. Each individual plant received one hour of sampling effort under stereoscopic microscope and we mounted all mites on glass slides in Hoyer's medium (Zhang 2003). We kept in a stove at a temperature between 50–60°C for approximately ten days for medium drying, fixation, distension, and classification of specimens. The morphological details with the help of an optical microscope with phase contrast. Drawings were made using a camera Lucida and the lines were digitized using Corel Draw X5®. Dorsum striae were made with Nankin, and the dorsal setae were made with Corel Draw X5®. The setal nomenclature is based on Grandjean (1934, 1939) and Lindquist (1985). All measurements are shown in micrometers (µm). Specimens collected were deposited at the Mite Reference Collection in the Museum of Sciences of Universidade do Vale do Taquari – Univates, Lajeado, Rio Grande do Sul, Brazil and Acarology and Entomology Department, Escola Superior de Agricultura “Luiz de Queiroz”, Universidade de São Paulo (ESALQ/USP), Piracicaba, São Paulo state, Brazil.

Systematics

Family Tetranychidae Donnadieu

Subfamily Tetranychinae Berlese

Tribe Tetranychini Reck

Genre *Tetranychus* Dufour, 1832:276; Pritchard & Baker, 1955:373; Wainstein, 1960: 149; Tuttle & Baker, 1968: 1244; Meyer 1974:216.

Tetranychus agriensis Ferla & Ferla **sp. nov.**

Figures 1 – 16

General diagnosis – Peritreme hooked distally; female dorsal striae with a unique pattern and with hourglass pattern between setae *e1* and *f1*; all empodium without mediodorsal spur; pre-genital striae solid; dorsal and ventral lobes in varied shapes, slightly separated. Male with aedeagus forked, curved upwards in a weakly sigmoid curve and the posterior margin has a prong-like extension; all empodium with proximoventral hairs and mediodorsal spur.

Description. Adult female.

Dorsum. (Figs 1 - 7) Idiosomal length 436 (390 - 488), width 364 (308 - 403) (figs 1 – 3). Dorsal striae with lacking lobes (fig 4). Palpus with spinnerets 6 (5 - 7) long and 5 (4 - 6) wide (fig 5). Peritreme hooked distally (fig 6). Dorsal setae slightly barbed, longer than the distance between their longitudinal bases. Measurements of dorsal setae: *v2–h1* 376 (320 - 364), *sc2–sc2* 243 (225 - 262); Setal lengths: *v2* 69 (62 - 73), *sc1* 175 (168 - 179), *sc2* 113 (108 - 120), *c1* 161 (149 - 175), *c2* 155 (145 - 161), *c3* 139 (133 - 150), *d1* 149 (143 - 155), *d2* 149 (142 - 157), *e1* 144 (138 - 149), *e2* 143 (137 - 150), *f1* 116 (107 - 125), *f2* 96 (92 - 100), *h2* 60 (58 - 64), *h3* 55 (50 - 59). Distance between dorsal setae: *v2–v2* 66 (65 - 67), *sc1–sc1* 94 (90 - 98), *c1–c1* 63 (48 - 70), *c3–c3* 286 (253 - 356), *d1–d1* 93 (89 - 97), *d1–d2* 69 (63 - 73), *e1–e1* 46 (43 - 50), *e1–e2* 78 (74 - 84), *f1–f1* 46 (40 - 54), *h2–h2* 26 (17 - 30); *c1–d1* 67 (49 - 84), *d1–e1* 56 (45 - 75); *e1–f1* 77 (67 - 84); *f1–h2* 104 (80 - 150). Hourglass striae pattern for the region between *e1–e1* and *f1–f1* (fig 7).

Venter. (Fig 8 - 9) All venter setae thin, smooth (fig 8). Pre-genital striae solid, entire and longitudinal (fig 9). Measurements: *ag* 75 (70 - 81), *g1* 53 (50 - 60), *g2* 52 (45 - 58), *ps1* 24 (23 - 27), *ps2* 25 (24 - 26).

Legs. (Figs 10 - 11) Empodium split distally, with four tenent hairs (fig 11). All the segments of the legs with striae (fig 10). Number of setae on legs (from coxae to tarsi, solenidia in parentheses) as follows:

Leg I - 2 - 1 - 10 - 5 - 9 (1) - 13 (1) + 2 duplex setae

Leg II - 2 - 1 - 6 - 5 - 7 - 13 (1) + 1 duplex setae

Leg III - 1 - 1 - 4 - 4 - 6 - 9 (1)

Leg IV - 1 - 1 - 4 - 4 - 7 - 10 (1).

Description. Adult male.

Dorsum and male. Body smaller than female. Length of idiosoma 333 (300 - 375), width 237 (218 - 265). Setae similar to female.

Palpus. (Fig 12) Palpus with spinnerets 5 long and 3 wide.

Legs. (Figs 13 - 14). Empodium split distally with four tenent hairs (fig 14).

All the segments of the legs with transverse striae (fig 13). Number of setae on legs (from coxae to tarsi, solenidia in parentheses) as follows:

Leg I - 2 - 1 - 10 - 5 - 9 (4) - 12 (3) + 2 duplex setae

Leg II - 2 - 1 - 6 - 5 - 6 (1) - 13 (1) + 1 duplex setae

Leg III - 1 - 1 - 4 - 4 - 6 - 9 (1)

Leg IV - 1 - 1 - 4 - 4 - 7 - 10 (1).

Aedeagus. (Figs 15 - 16). Unique, different, forked, curved upwards in a weakly sigmoid curve and the posterior margin has a prong-like extension.

Differential diagnosis. The aedeagus of this new species is similar to *T. armipenis* because is forked but differs in having a curved upwards in a weakly sigmoid curve and the posterior margin has a prong-like extension. Female has pre-genital striae solid, entire and longitudinal. There are no *Tetranychus* in Rio Grande do Sul that has this pattern of pregenital striae and hourglass between setae *e1-e1* and *fl-fl*. Besides, the species has dorsal and ventral lobes variated in shape and well separated. The male of this species has medioventral spur in all empodium, similar to *Tetranychus mexicanus* (McGregor), and the female doesn't have any spur on all empodium, differing of female *T. mexicanus* empodium. This species has a unique female dorsal striae pattern, not compared with any other *Tetranychus* species.

Etymology. The epithet specific refers to the floristic formation where it was collected.

Type material. Holotype female, 10 paratype females, three paratype males: Pantano Grande, Rio Grande do Sul, Brazil, collected by F. Spies on February 20, 2017. Holotype female and male deposited at Acarology and Entomology Department, Escola Superior de Agricultura "Luiz de Queiroz", Universidade de São Paulo (ESALQ/USP), Piracicaba, São Paulo state, Brazil. All paratypes are deposited at Museum of Natural Science (ZAUMCN), Universidade do Vale do Taquari - Univates, Lajeado, Rio Grande do Sul state, Brazil.

Acknowledgments

The authors are grateful to Coordination for the Improvement of Coordenação de Aperfeiçoamento de Pessoal de Nível Superior - Brasil (CAPES) - Finance Code 001. Noeli Juarez Ferla (Process number 310035/2017-1) is supported by a CNPq productivity research,

Celulose Riograndense Company and Univates University for their financial support, to Vinícius Leão da Silva, for the plant identification and to the anonymous referees for their suggestions and comments, which helped to improve the manuscript.

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Figure captions

Figure 1: *Tetranychus agriensis* **sp. nov.**, female. Idiosoma in dorsal view.

Figure 2: *Tetranychus agriensis* **sp. nov.**, female. Phase contrast microscope. Idiosoma striae pattern, from setae *v2* to *d2*.

Figure 3: *Tetranychus agriensis* **sp. nov.**, female. Phase contrast microscope. Idiosoma striae pattern, from setae *c1* to *f2*.

Figure 4: *Tetranychus agriensis* **sp. nov.**, female. Phase contrast microscope. Dorsal lobes.

Figure 5: *Tetranychus agriensis* **sp. nov.**, female. Palpus.

Figure 6: *Tetranychus agriensis* **sp. nov.**, female. Peritreme.

Figure 7: *Tetranychus agriensis* **sp. nov.**, female. Phase contrast microscope. Hourglass patterns, between setae *e1* and *f1*.

Figure 8: *Tetranychus agriensis* **sp. nov.**, female. Phase contrast microscope. Anogenital region, in ventral view.

Figure 9: *Tetranychus agriensis* **sp. nov.**, female. Phase contrast microscope. Pre-genital striae.

Figure 10: *Tetranychus agriensis* **sp. nov.**, female. A - tibia and tarsus of leg I; B - tibia and tarsus of leg II

Figure 11: *Tetranychus agriensis* **sp. nov.**, female. A - empodium I; B - empodium II; C - empodium III; D - empodium IV.

Figure 12: *Tetranychus agriensis* **sp. nov.**, male. Palpus.

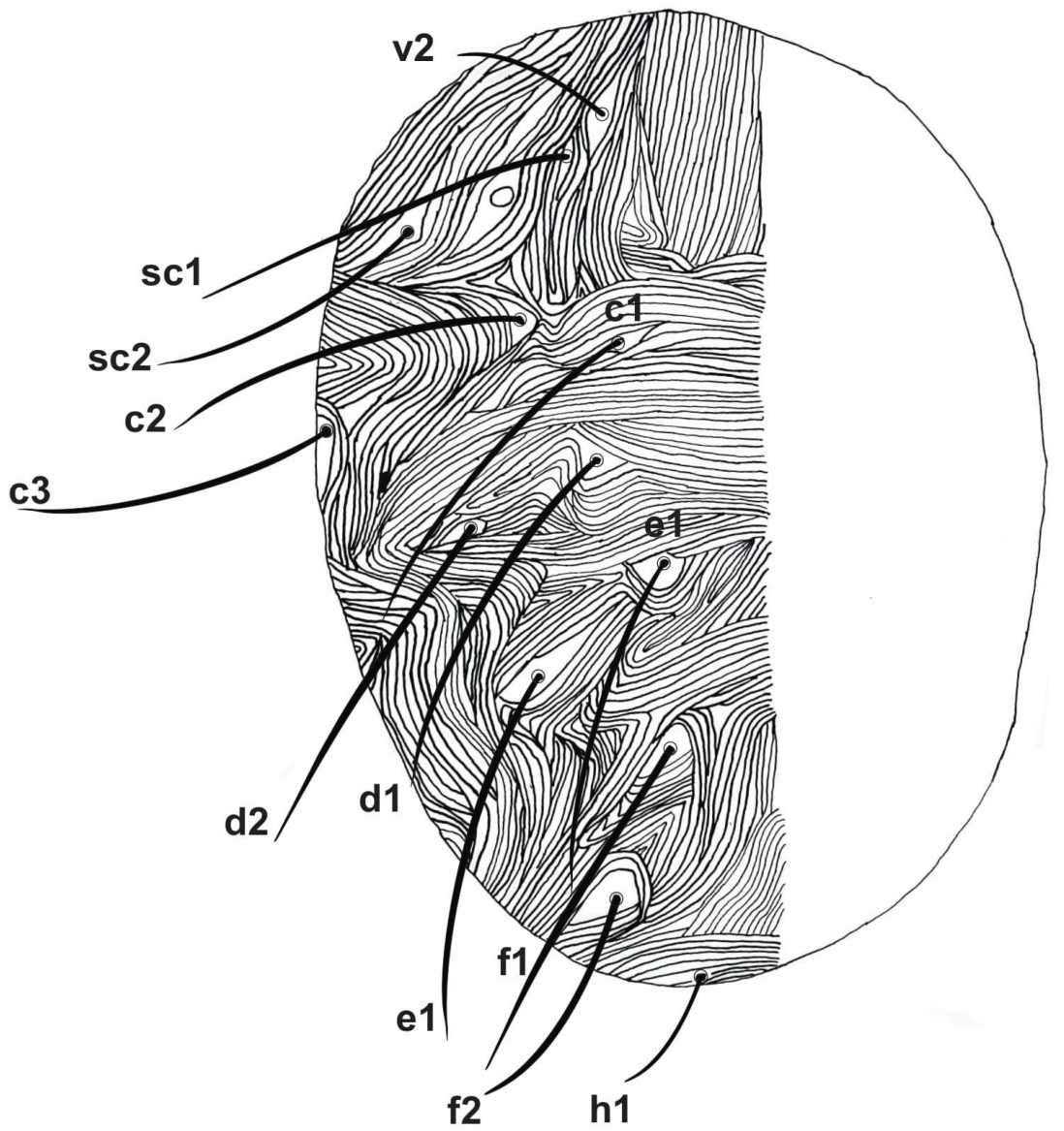
Figure 13: *Tetranychus agriensis* **sp. nov.**, male. A - tibia and tarsus of leg I; B - tibia and tarsus of leg II.

Figure 14: *Tetranychus agriensis* **sp. nov.**, male. A - empodium I; B - empodium II; C - empodium III; D - empodium IV.

Figure 15: *Tetranychus agriensis* **sp. nov.**, male. Aedeagus.

Figure 16: *Tetranychus agriensis* **sp. nov.**, male. Phase contrast microscope.

FIGURE 1



1

FIGURE 2

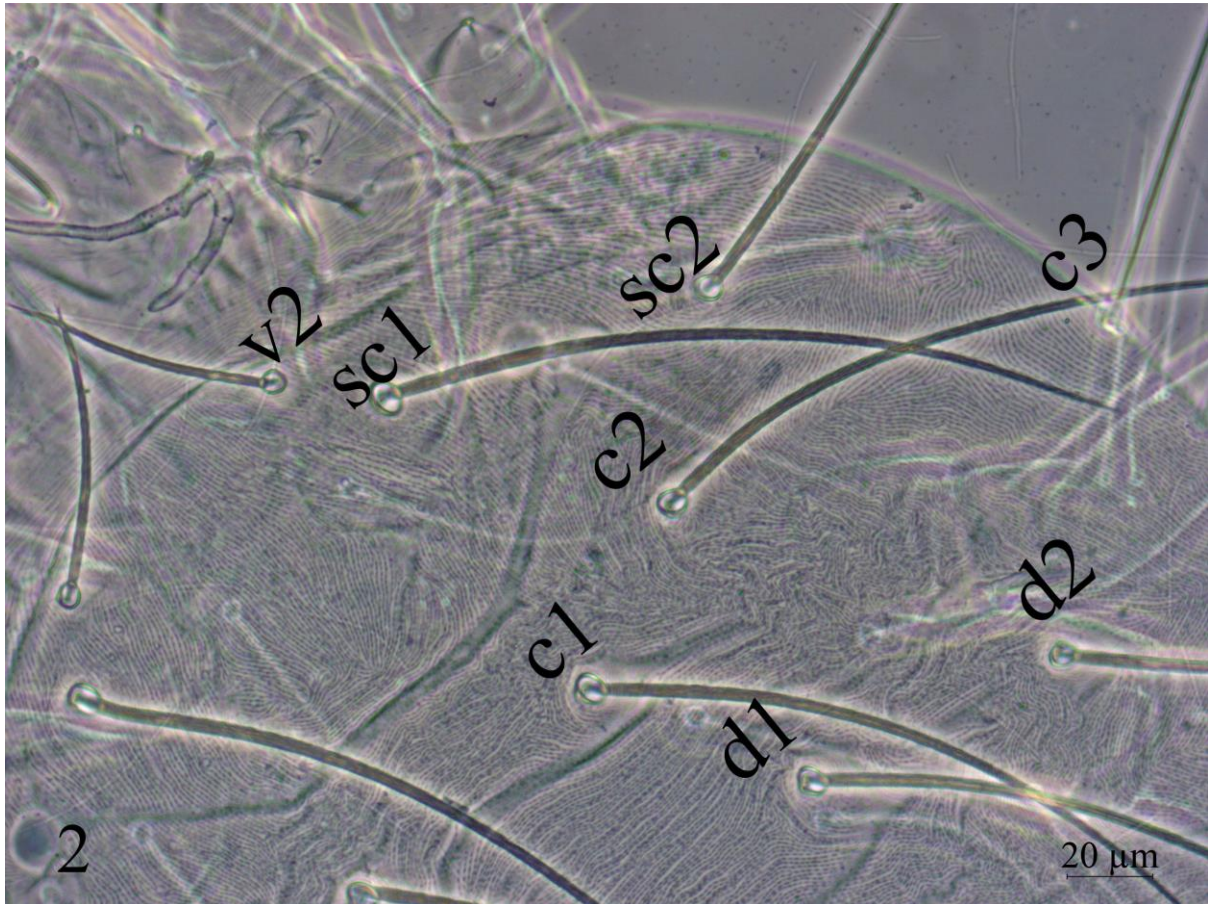


FIGURE 3



FIGURE 4

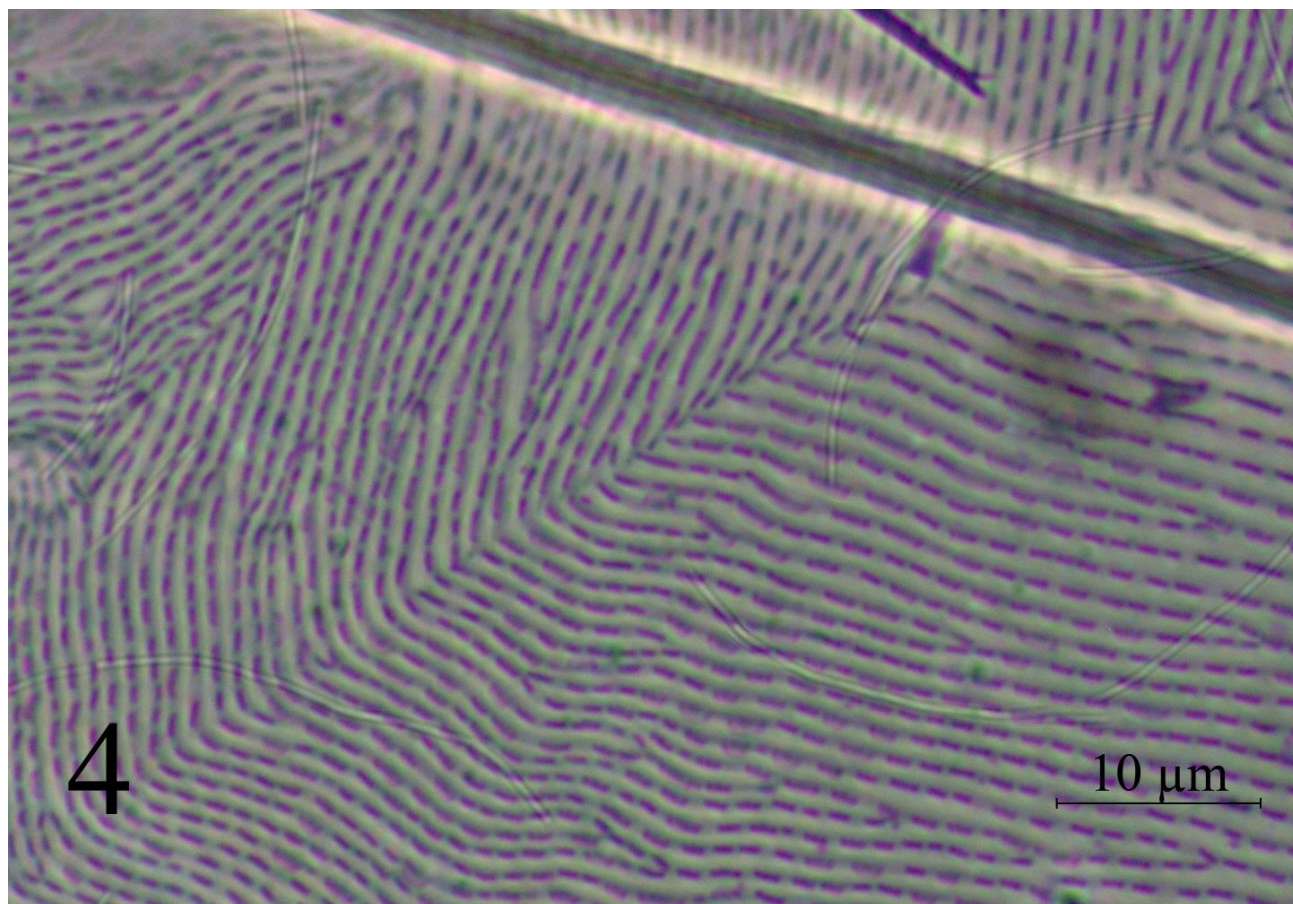
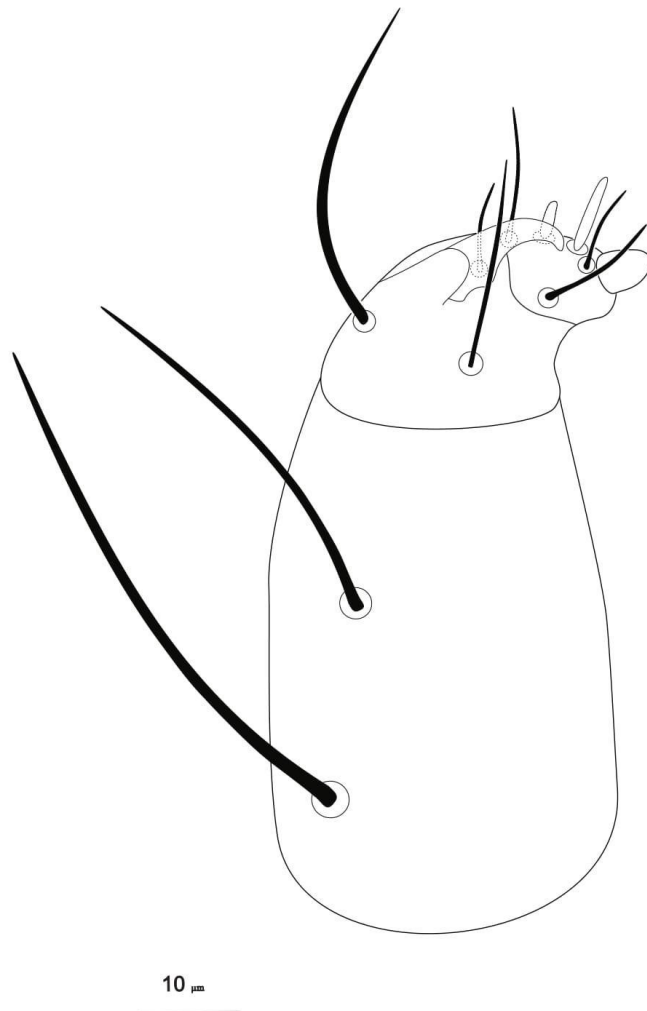
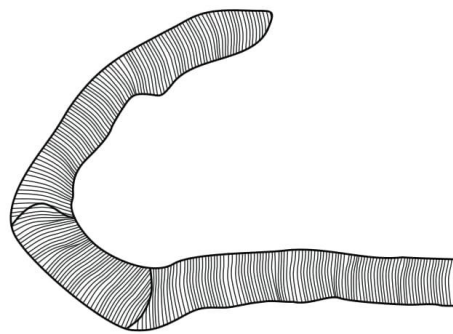


FIGURE 5



5

FIGURE 6



10 μm

6

FIGURE 7



FIGURE 8



FIGURE 9

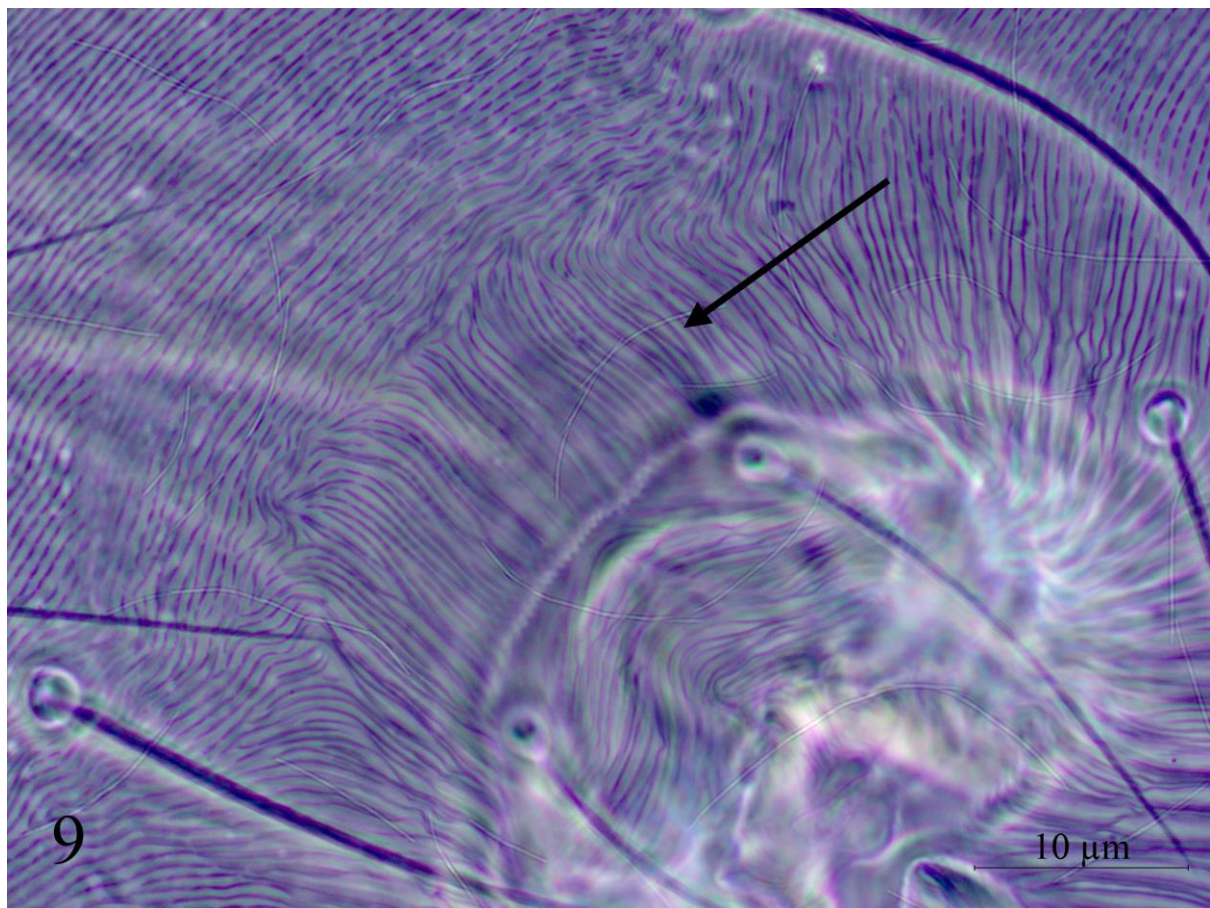
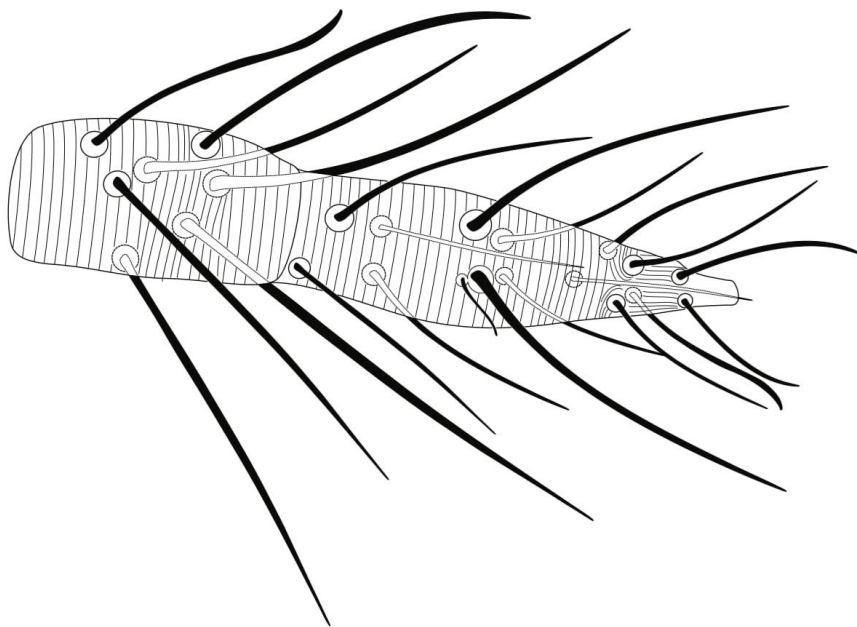
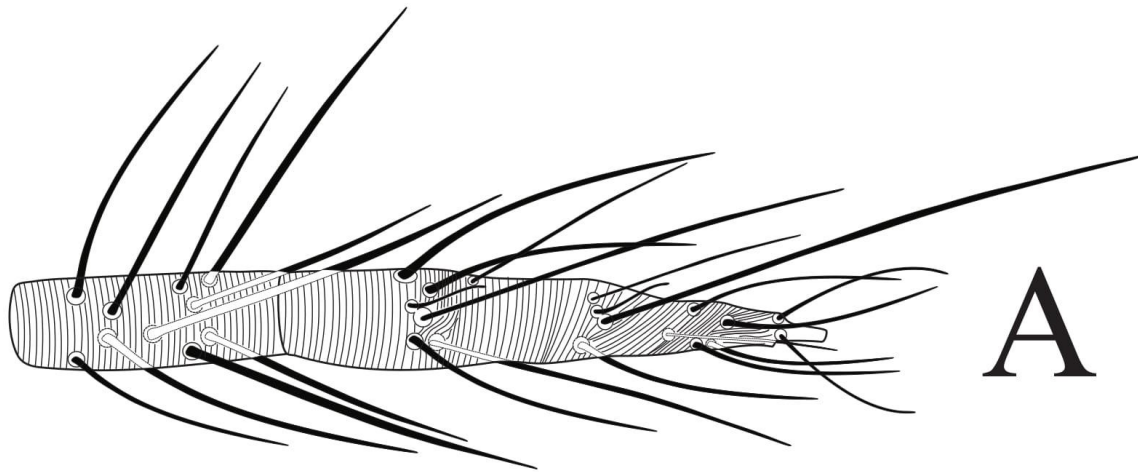


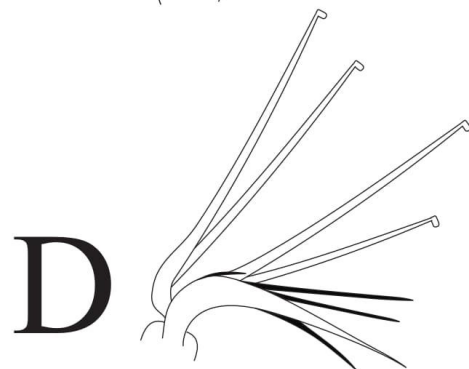
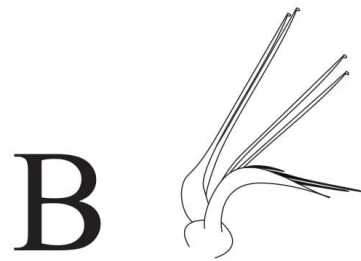
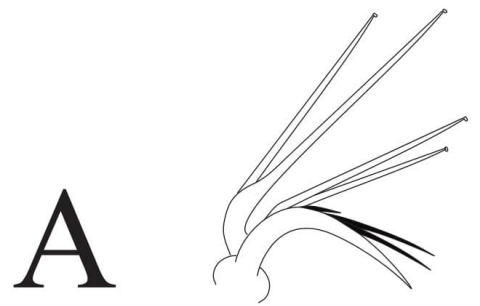
FIGURE 10



10

50 μ m

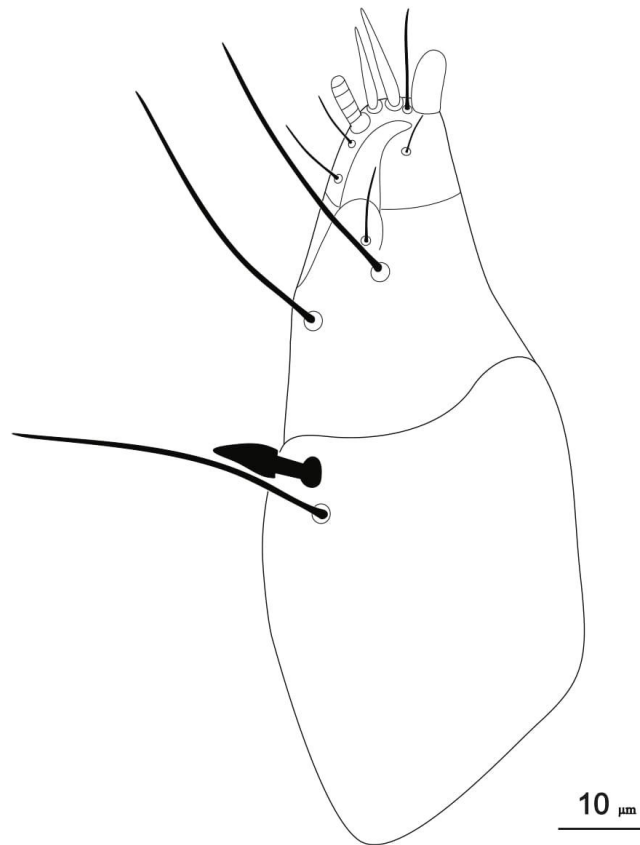
FIGURE 11



10 μ m

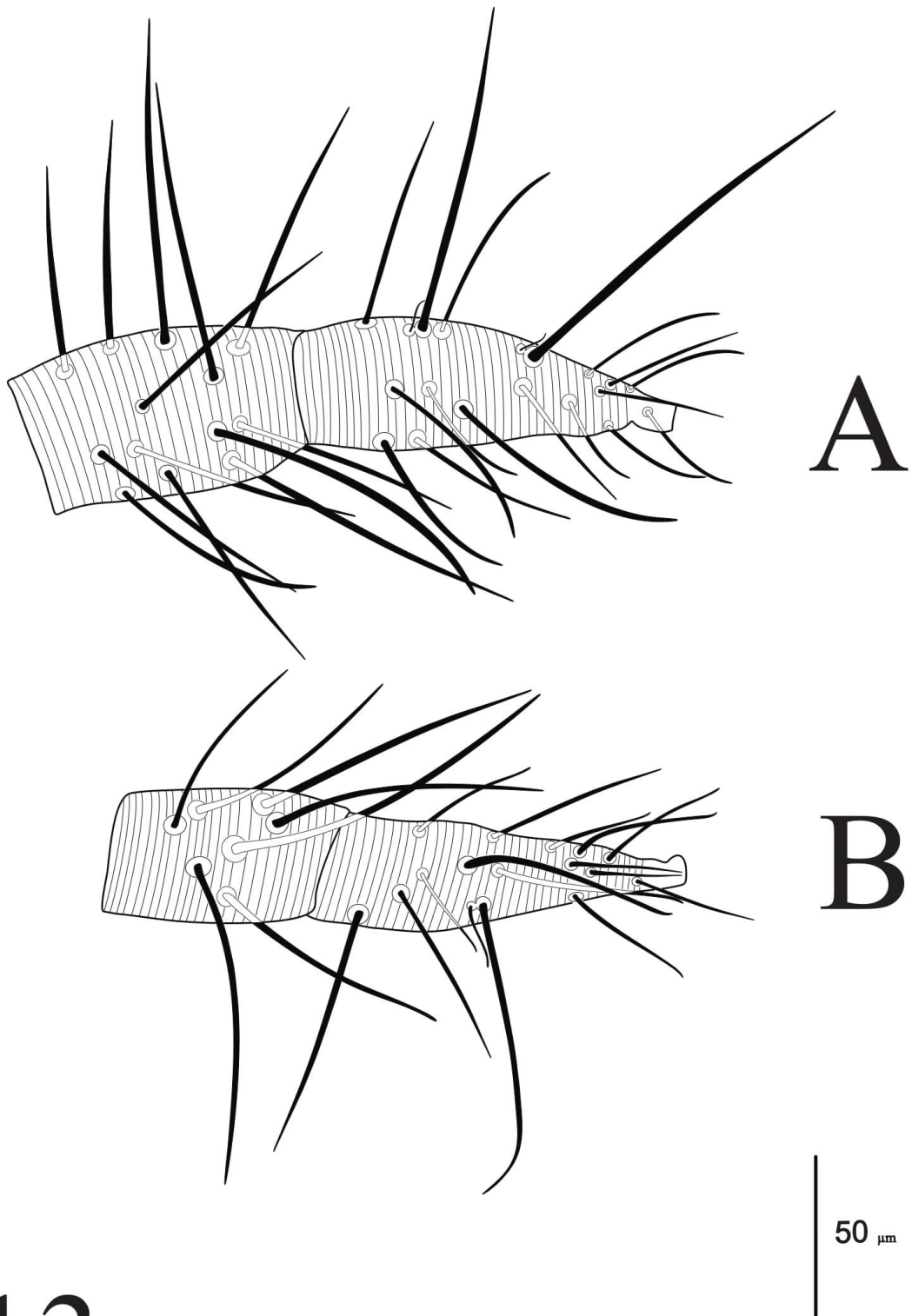
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FIGURE 12



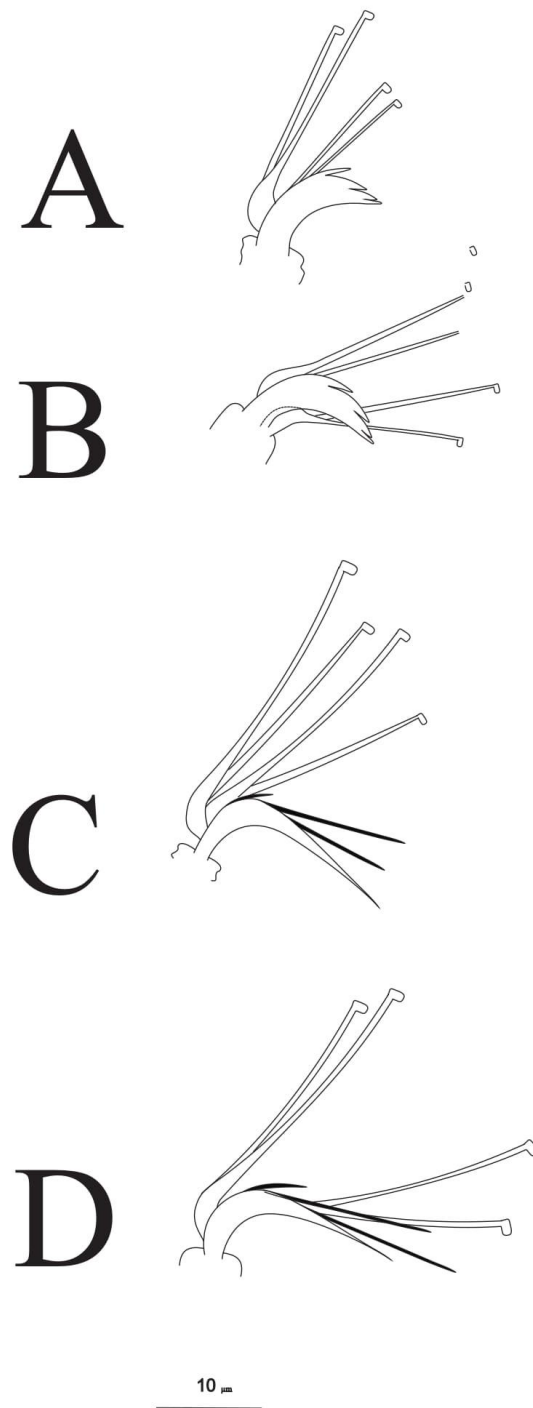
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FIGURE 13



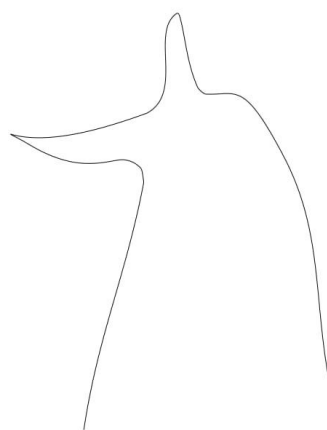
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FIGURE 14



14

FIGURE 15



20 μm

15

FIGURE 16

